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**Perturbation from Dirichlet problem involving oscillating nonlinearities.** (English)

Zbl 1220.35030

J. Differ. Equations 234, No. 1, 80-90 (2007).

The authors deal with the following perturbed Dirichlet problem

$$-\Delta u = f(x, u) + \lambda g(x, u) \quad \text{in } \Omega,$$

$$u = 0 \quad \text{on } \partial\Omega,$$

where  $\Omega$  is a bounded set in  $\mathbb{R}^d$  with smooth boundary,  $f, g : \Omega \times \mathbb{R} \rightarrow \mathbb{R}$  are given functions. The key role is played by the assumptions on  $f(x, \cdot)$  that  $f$  is allowed to change sign, uniformly with respect to  $x$ , in any neighborhood of zero (respectively  $+\infty$ ), which in turn implies an oscillating behaviour for its potential  $F(x, t)$ ,  $F(x, t) := \int_0^t f(x, s) ds$ . Under some suitable assumptions  $f, g$  and  $\lambda$ , the authors prove existence of at least  $k$  distinct weak solutions in  $W_0^{1,2}(\Omega)$ , for every  $k \in \mathbb{N}$ .

Reviewer: Messoud A. Efendiev (Berlin)

**MSC:**

35J20 Variational methods for second-order elliptic equations

35J25 Boundary value problems for second-order elliptic equations

Cited in **1** Review  
Cited in **7** Documents

**Keywords:**

Dirichlet problem; weak solution; strong solution; oscillating nonlinearities

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**References:**

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